ABSTRACT

Disclosed are formulations adapted to form a foamed cementitious composition, the foamed cementitious composition itself, a method of forming a hydraulic binder foam, and a method of conveying and applying the resulting foam to a substrate. A pumpable cementitious slurry is formed, the slurry is mixed with a gas such as air, and is subjected to mechanically created turbulence to generate gas bubbles and create a foam, which preferably is stabilized by a foam stabilizing agent such as polyvinyl alcohol present in the slurry. The foam is then conveyed to a nozzle or other suitable dispense point from which it is applied, for example sprayed, preferably uniformly, onto a substrate to be coated. Prior to dispensing, a set accelerator is preferably injected, which causes the foam to gel, which in turn improves the hangability of the product on a substrate. The spray material adheres to the substrate and hardens to form an insulative coating on the substrate. Also disclosed are dry compositions comprising a hydratable cementitious binder, a mechanical foam stabilizing agent, and optionally a fibrous component, set retarder and air entraining agent, said composition providing, on the addition of water, gas and mechanical turbulence, a settable foam which is capable of spray application to a steel structural member and which, after spray application, is adherent to the member in the foamed state and after setting. The foam after setting, forms a fire and heat protective adherent coating on the member.